1215-32 Diagnosis of Coronary Artery Disease in Heart Failure: Role of Myocardial Contrast Echocardiography in Patients With First Presentation of Heart Failure Not Due to Acute Myocardial Infarction

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Background: Identification of significant coronary artery disease (CAD) as the underlying cause of heart failure (HF) in patients presenting for the first time with no clinical evidence of acute myocardial infarction (AMI) has important therapeutic and prognostic implications. Dobutamine echocardiography and radionuclide SPECT myocardial imaging is now widely used to identify patients with significant CAD. Myocardial contrast echocardiography (MCE) during stress has the potential to accurately detect CAD. We hypothesised that MCE with vasodilator stress can accurately identify CAD in patients presenting for the first time with HF.
Methods: Consecutive patients with first presentation with HF and no clinical evidence of AMI were assessed with simultaneous dipyridamole low power continuous MCE using IV Optison® and SPECT after the patients were medically stabilised. Coronary angiography was performed based on clinical grounds.
Results: Left ventricular ejection fraction in the 55 pts studied was 36 ± 15%. Forty patients underwent coronary angiography of which 17 showed significant CAD (>50% diameter stenosis of any major coronary arteries). Both MCE and SPECT correctly detected 16 (94%) of these 17 patients. Of the 23 patients without significant CAD, MCE showed normal perfusion in 22 (96%) and SPECT in 19 (83%) patients. Concordance between MCE and coronary angiography for the diagnosis of CAD was 93% (kappa = 0.85), and that between SPECT and coronary angiography was 85% (k=0.70).
Conclusion: There was no significant difference between MCE and SPECT for the detection of significant CAD as the underlying aetiology in patients presenting for the first time with HF not due to AMI. Nevertheless, the bedside availability of MCE makes it the technique of choice for the diagnosis of ischaemic cardiomyopathy in this patient cohort.

1215-47 Predischarge Myocardial Contrast Echocardiography Predicts Long-Term Clinical Outcomes and Left Ventricular Remodeling in Patients With Myocardial Infarction

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Background: We examined whether perfusion study with myocardial contrast echo (MCE) at pre-discharge can predict remote clinical, functional and morphological outcomes in the patients with AMI.
Methods: Study population was consisted of consecutive 168 AMI patients. We performed MCE with bolus (2-3 ml) injection of Levovist at pre-discharge (a mean of 2 weeks). We recorded intermittent harmonic power Doppler or Ultraharmonic images at intervals of 4 cardiac cycles with SONOS5500 (Philips). In apical 2- and 4-chamber views, we divided the left ventricle into 6 segments and evaluated the presence or absence of perfusion defect (PD). We performed 2-D echo at day-1 (1d) and 3-6 months later (FU) and measured LV end-diastolic dimension (LVDd, mm) and wall motion score (WMS: sum of 17 segment scores (0:normal to 3:a/dyskinesis)). Cardiac events were recorded in each case.
Results: Recovery of wall motion got poor, LV tended to dilate and the cardiac events got higher with an increase in number of PD segments. In half of patients with segments with akinetic but positive perfusion, wall motion improved at FU study, but no functional recovery was found in PD segment.

	PD≤1	PD=2	PD≥3
Number of patients	102(66％)	36(21％)	30(18％)
WMS 1d/FU	13±6/7±7*	18±6/14±6*	19±7/15±9
LVDd 1d/FU	50±5/50±6	51±6/54±6*	52±5/55±5*
Cardiac events	29(28%)†	16(44%)	13(41%)

* P<0.01 vs. 1d †p<0.05 vs.other groups
Conclusion: Pre-discharge perfusion study with MCE in patients with AMI provides useful information for the risk stratification among reperfused patients with AMI. Substantial size of perfusion defect is associated with LV remodeling and higher cardiac events.

1215-48 Cardiac Raynaud Phenomenon and Myocardial Fibrosis in Sclerodermic Cardiomyopathy

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Purpose: Sclerodermic cardiomyopathy is one of most important visceral involvements in progressive systemic sclerosis (PSS). We investigated the relationship between the cardiac Raynaud's phenomenon (c-Raynaud) and myocardial fibrosis in sclerodermic cardiomyopathy by intravenous contrast echocardiography (IV-MCE).
Methos: We examined 22 PSS patients with c-Raynaud. Age- and gender- matched 16 healthy volunteers served as normal controls. In PSS patients we induced c-Raynaud by cold provocation and performed IV-MCE before and during the induction of c-Raynaud. Using an ultrasonic system with intermittent harmonic mode, IV-MCE was performed. The contrast agent Levovist was administered by continuous infusion. We set ROI at the interventricular septum near the apex to minimize the ultrasound attenuation and obtained replenishment curve of acoustic intensity by changing trigger interval. From the replenishment curve we measured the plateau intensity (Plateau-int) and the rate of rise of intensity (Rate-int) for the evaluation of the myocardial perfusion. In PSS patients we quantitated the severity of myocardial fibrosis from endocardial biopsy samples.
Results: Before induction of c-Raynaud, Plateau-int and Rate-int were not different between PSS patients and controls. However during induction of c-Raynaud in PSS patients, Plateau-int and Rate-int were significantly decreased and showed close correlations with the severity of myocardial fibrosis.
Conclusion: In sclerodermic cardiomyopathy, myocardial perfusion insufficiency due to cardiac Raynaud's phenomenon has an important role in myocardial fibrosis.

1215-49 Patent Foramen Ovale Is More Common in Migraine Headache Sufferers Than in Controls

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Background: Patent Foramen Ovale (PFO) has been implicated as a causative factor in migraine cephalgia (MC). This study assessed whether a PFO is more common in patients with an established diagnosis of migraines.
Methods: 2-D echocardiography with simultaneously administered intravenous agitated saline (NS) was performed in 183 patients with MC and in 130 controls. NS was injected via a peripheral vein after obtaining adequate visualization of the atrial septum and pulmonary veins in the parasternal and apical views. The number of cardiac cycles between the appearance of right atrial to left atrial NS contrast was counted. A PFO was defined as being present when the cardiac cycle count as defined above was = 4; or within 2 cardiac cycles following valsalva. Contrast appearance after this time period was felt to represent normal pulmonary blood flow.
Results: The incidence of PFO for migraine patients as compared to controls was 55 vs. 25 (p = <0.004). The pulmonary shunting difference between the two groups was 21 vs. 13 (p = ns)
Conclusions: A significant difference in the incidence of R → L shunting via PFO was detected in MC patients as compared to age-matched controls (p 0.004). This data supports previous publications suggesting a higher incidence of R → L shunting in MC as demonstrated by transcranial doppler flow There was no difference in the incidence of normal intrapulmonary flow. This is the first echocardiography-based study to demonstrate a statistically significant link between PFO and MC. The question has now been raised; should all patients who suffer from migraines and have a documented PFO be offered percutaneous closure?

1215-50 Can Myocardial Contrast Echocardiography Predict Cardiac Events in the Patients With Acute Chest Pain?

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Background: The purpose of this study was to investigate whether real-time myocardial contrast echocardiography (MCE) can predict cardiac events in the patients with acute chest pain.
Methods: We prospectively enrolled 101 patients (age : 61±10 years, 57 men) who presented to the emergency room with acute chest pain. Exclusion criteria were ST-elevation myocardial infarction and poor echo window. Within 12 hours of episodes of chest pain, two-dimensional echocardiography (2DE) was performed to evaluate regional wall motion abnormality and non-stress MCE was performed to evaluate perfusion defect using real-time low mechanical-index power modulation imaging during continuous infusion of PESDA. Late refilling of myocardium (longer than the 10th cardiac cycle after high power pulses) was considered as perfusion defect. Coronary angiography was performed in all consecutive patients. Cardiac events included myocardial infarction and revascularization.
Results: Of the 101 patients studied, 68 had significant coronary artery disease (diameter stenosis > 70%), and 58 had cardiac events including 21 myocardial infarction, 34 percutaneous transluminal coronary angioplasty, and 14 coronary artery bypass graft. Among 58 patients with cardiac events, regional wall motion abnormality was observed in 34 (59%) patients, and perfusion defect was observed in 44 (76%) patients. The specificity of 2DE and MCE for cardiac events were 79% and 77%, respectively. There were no significant differences in history of hypertension or diabetes, but male gender, smoking, and abnormal ECG (T inversion>0.2mV or ST depression>0.1mV) were more frequent in patients with cardiac events (p<0.05). With multivariate logistic regression analysis, only perfusion defect independently predicted cardiac events (p=0.002, odds ratio=6.731).
Conclusion: MCE in patients with acute chest pain identifies those who will have cardiac events, and is more sensitive than 2DE.